

THE FEATURES OF MUNICIPAL WATER REVENUE OBLIGATIONS
FOR SELECTED CITIES IN TEXAS
1948

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CHAPTER I

INTRODUCTION

Statement of the Problem.--

The term "municipals" includes many different types of securities which shade into each other by imperceptible degrees. From many points of view, the differences appear greater than the similarities since the only points the various types have in common are: (1) they are issued by states, or their political subdivisions, or instrumentalities thereof; (2) they are payable from some form of public revenue; and (3) income therefrom is with few exceptions exempt from the Federal income tax.¹

Municipal bonds are issued by three types of agencies; (1) regular governmental units; (2) special districts; and (3) statutory authorities. Regular governmental units such as states, counties, cities and townships possess broad general powers. Their activities are largely non-revenue producing and taxes are the principal source of revenue for most of them. Special districts such as school districts, water districts, road districts and park districts have the power to tax, but differ from regular governmental units in that they are organized for the promotion of one or, at most, a limited number of activities. Statutory authorities such as bridge commissions, port authorities, housing authorities and toll road commissions are public corporations without the power to tax, organized in many cases for the purpose of promoting revenue-producing projects. Their revenues are derived from the sale of services, or from grants or subsidies from other governmental units.

¹

Committee on Municipal Obligations, National Association of Supervisors of State Banks, Municipals, ed. E. A. Wayne, Chairman (Washington, 1941), p. 31.

With regard to the character of the security in classifying municipal obligations there are three principal types of pledges used to secure the obligations of political subdivisions: (1) general credit; (2) special assessments; and (3) specific revenues. The best known type of municipal security is the general credit obligation, also called full faith and credit, in which the issuing unit agrees unconditionally to pay the obligation. Ordinarily interest and principal are to be paid from the general fund, but sometimes special revenues are also pledged. In the latter case, the unit agrees unconditionally to levy taxes to cover any deficit which may later develop in the fund primarily responsible. Thus, general credit obligations rest upon the taxing power. Special assessment bonds are ordinarily issued to pay for such improvements as streets, sewers, and for sidewalks. The local government agrees to levy assessments on the property which is presumably benefited by the improvement, and earmark the same for the payment of the bonds. Revenue obligations are secured by a pledge of revenues of specific earning assets, that is, the assets acquired with the proceeds of the bond issue. The issuing government assumes the responsibility of operating the property and agrees to use the receipts for the payment of debt, but does not agree to levy taxes or make appropriations from the general fund, if the pledged revenues prove insufficient.

A study of Corporate Finance revealed that a continued and unwise use of the borrowing power will result in pyramiding of debt and financial difficulties. Thus, the purposes for which funds are borrowed are of vital importance in classifying and analyzing municipal obligations. Also, the usefulness of the service or function financed can often affect the ability to pay the indebtedness. Among the more important purposes for

which funds are borrowed are: capital improvements, utilities, emergencies and catastrophes, funding and refunding.

The terms on which municipalities agree to pay their obligations vary greatly. A bond issue may mature either at one date or serially, and the inclusion of a call feature may reserve certain options of payment to the issuer. The contract provisions under which a call can be exercised are numerous. Some issues are callable in whole only, some in part only for the sinking fund, and some either in whole or in part. Frequently bonds are not callable until after a specified date. Ordinarily the right to call can be exercised only upon the payment of a premium, which often becomes less as the bonds approach maturity.

Not all combinations of the above classifications are in common usage. The great variety is illustrated by the number of choices available to a city wishing to borrow money for the construction of a water system. This may be seen by the following outline. The city may:

- A. Issue Bonds Directly
 - 1. Pledge the general credit
 - a. With specific pledge of water revenues
 - b. Without pledge of water revenues
 - 2. Issue revenue bonds
- B. Create a Water District
 - 1. Pledge the general credit
 - a. With specific pledge of water revenues
 - b. Without pledge of water revenues
 - 2. Issue revenue bonds
- C. Create an Authority to Sell Revenue Bonds¹

The variations which are shown in the outline do not include all of the possibilities open to a city. Sewers, for example, are often financed in connection with the water system. The additional revenues that are needed

¹

Ibid., p. 35

for meeting the increased costs are sometimes obtained by increasing the water rates and sometimes by means of special assessments. The financing of water systems is characteristically much less complicated than the financing of most other services, an electric and gas revenue debt for example. The long and, on the whole, excellent record of water bonds makes it unnecessary in most instances to complicate the municipal bond contracts with protective features designed to make them salable.

Through the above classification of municipal obligations it can be seen that although municipal revenue bonds are not the best and most widely used investment securities they plan a conspicuous part in municipal finance. The water works bonds, especially have a good reputation probably due to the fact that municipal water works have a monopoly on a fundamental service. Bills are rendered at regular intervals and the water can be cut off before large unpaid balances accumulate.

The taxpayer, the business man, the student and even the fiscal expert has difficulty it seems in informing himself on the financial procedure and operations of municipals. He is confronted with a vast and involved fiscal structure. The task of this Thesis is not to delve into massive and complicated records of city finance but merely to analyze the features of one phase of municipal indebtedness examining any influences upon the status of the specific issues with which the study is concerned.

Scope of the Study.--What cities face is not a single, homogeneous problem; there are as many types of municipal revenue problems as there are kinds of cities. For the problems of some cities there is no single or simple solution. This grows out of their economic base and an unstable economic life. The complicated financial affairs of municipals definitely

warrant municipal long-term borrowing as justified by the fact that "municipal borrowing in some form has existed since colonial days."¹ This need for long-term borrowing by municipals arises from the lack of statistical regularity in the capital expenditures of the municipality. The need for capital improvements in cities arise at irregular and unpredictable intervals. An exploration of one phase of municipal finance among different cities with different economic backgrounds and in different population groups is expected to reveal the influence of size and other factors on the type of municipal borrowing embarked upon by cities in dissimilar situations.

This investigation embraces an analysis of the features of municipal water revenue obligations for selected cities in the State of Texas, 1948 by using several norms noting the variations of each. The data gathered for the municipalities represents only a select sample. Since there are well over five hundred incorporated municipalities in the State of Texas, no attempt was made to obtain complete coverage. The study, therefore, was confined to an analysis of the water revenue obligations outstanding in 1948 of only six municipalities which were divided into three population groups. Of the six municipalities used, two, Houston and San Antonio, represent cities in Texas with a population of over 100,000 according to the 1940 United States Census; two, Beaumont and Amarillo, represent cities in Texas with a population of 50,000 to 100,000 and the remaining two, Abilene and Bryan, represent cities in Texas with a population of less than 50,000.

1

Leroy Altus Shattuck, "Municipal Indebtedness," The John Hopkins Studies in Historical and Political Science (Baltimore, 1940), Volume 58, Part 2, p. 12.

Methodology.—Collection of data was confined mainly to the reports on file by Moody. Upon examination of Moody's Manual of Governments and Municipals it was found that the water revenue obligations issued by each selected city were described at length. Bulletins from the State of Texas and the United States Bureau of the Census supplied related information. The cities selected were divided into three population groups, each group comprising a chapter of this Thesis. The information at hand was explored fully to extract the features of each issue, to compare, to discover and explain, if possible, the reasons for the issues.

Purposes.—As a result of this investigation it is expected to accomplish the following ends of value:

1. To study the investment status of municipal water revenue obligations relative to other municipal obligations taking into consideration legality and quality.
2. To evaluate size of municipalities as a determinant of features of municipal water revenue obligations.
3. To weight any other influences upon the terms and status of municipal water revenue obligations.

CHAPTER II

THE FEATURES OF MUNICIPAL WATER REVENUE OBLIGATIONS FOR GROUP I, 1948

Houston, Texas

On October 1, 1944 the City of Houston issued the following prior lien water revenue obligations, the features of which are described as by Moody¹ below.

4 1/4s	1944	Serially 10 -	1-47-51	April and October 1	\$ 2,344,000
2s	1944	Serially 10 -	1-52-69	April and October 1	11,656,000

Maturity.—Due each October 1, to 1969, inclusive as follows:

1948	\$ 429,000	1956	\$ 590,000	1963	\$ 677,000
1949	437,000	1957	602,000	1964	691,000
1950	524,000	1958	614,000	1965	704,000
1951	534,000	1959	626,000	1966	719,000
1952	545,000	1960	638,000	1967	733,000
1953	556,000	1961	651,000	1968	748,000
1954	567,000	1962	664,000	1969	753,000
1955	578,000				

Interest.—April and October 1 at Chase National Bank, New York. Principal and interest payable in United States legal tender.

Fiscal Agent.—Union National Bank, Houston, Texas.

Denomination.—Coupon, \$1,000.

1

Moody's Manual of Investments, Governments and Municipals, (New York, 1948), p. 1175.

Callable.--On or after October 1, 1951 in inverse numerical order or any interest date at 102 1/2 to October 1, 1953, inclusive; thereafter at 101 1/2 to October 1, 1957, inclusive; thereafter at 101 to October 1, 1960, inclusive, and thereafter at par.

Security.--Bonds do not constitute a debt of the city, but are payable solely from the net revenues of the water system of the city after payment of cost of operation and maintenance; also secured by pledge of such income.

Additional Bonds.--No bonds may be issued with a lien prior to or equal to the lien of this issue. Bonds junior in lien may be issued.

Legality.--Approved by Reed, Hoyt and Washburn, New York.

Purpose.--Issued to provide the following funds: \$5,000,000 for construction of water wells with storage reservoirs, pumping stations and mains; \$1,000,000 for purchase of water industries project; \$8,000,000 for construction of dam, filter plant and transmission main upon termination of the war.

Rating.--Revenue bonds are not rated.

Economic and Financial Background of the City of Houston and its Water Supply Issue

State.--Texas has a population of 6,414,824 according to the 1940 United States Census with a land area of 262,378 which gives it a population per square mile of 24.3. The wealth of the state is stated as being \$1,662 per capita. Its principal manufacturing industries are petroleum refining, meat packing, flour and other grain mill products, cottonseed oil, cake, meat and linters, oil-field machinery and tools and printing and publishing. A statement of its gross and long-term debt at the end of the fiscal year, 1948 is given as follows: the total gross debt of the state amounted to

\$20,645,000, all of this amount being general debt. The total long-term debt amounted to \$20,575,000, \$4,102 of this amount being full faith and credit debt and \$16,473,000 being non-guaranteed debt. The state had a short-term debt of \$70,000. Its sinking fund offsets to the long-term debt amounted to \$1,931,000 giving it a net long-term debt of \$18,644,000.

County.—Harris County was organized in 1837. It has an area of 1,654 square miles of which 54.4% represented farm lands at January 1, 1945. Its principal products (by value) are dairy products, wheat and cattle. Its chief industries are manufacturing, dairying and farming. The county had a population of 528,961 in 1940 which had increased to an estimated 700,000 in 1947.

City.—Houston is the county seat of Harris County. It was incorporated as a city in 1839 and annexed Houston Heights on March 1, 1918. It is an important railroad center and agricultural and live-stock distributing point. The largest city of the State in population and manufactures, its principal principal activity is the cotton-seed industry. Other industries include slaughtering and meat packing, cleaning and polishing of rice, railroad repair shops, lumber and timber production. Houston is one of the principal ports of the United States ranking first in cotton exports.

On August 15, 1942, the electorate approved a change from the commission to city manager form of government. The change became effective January 2, 1943. The city owns and operates its gas plant, sewage disposal plant, water works, port facilities, public market and airport.

In 1940 the Federal Bureau of Census showed a population of 384,514 for the City of Houston. The population trend since 1900 has been as follows: 1900, 44,633; 1910, 78,800; 1920, 138,276; 1930, 334,280; 1940,

384,514; 1945 estimate, 575,000; and 1950 estimate, 690,000.

In 1944 the city's water supply came entirely from an underground source. In October of that year the city sold \$14,000,000 bonds to carry out a plan adopted in July, 1943 providing for immediate construction of additional wells with storage reservoirs, pumping station and mains; immediate purchase of pumping station and canal constructed by Federal Government to supply untreated San Jacinto River water to industries in the metropolitan area along the Houston Ship Channel; and upon termination of the war, construction of a dam on the San Jacinto River with filter plant and transmission main for this supply. In 1945 the city sold its port facilities under a contract whereby Harris County Navigation District assumed certain bonded indebtedness of the city.

A statement of the city's manufactures at the end of the fiscal year, 1948 showed the following: number of establishments, 589; wages, \$19,328,000; cost of materials, et cetera, \$72,440,000; value of products, \$141,738,000.

The assessed value of the city's property at the end of the fiscal year, 1948 was as follows: all property, \$404,528,700; basis of asses, 50 percent; city tax per \$1,000, \$19.50; tax rate limitation, \$20.00 per \$1,000.

The city's general and enterprise debt outstanding at the end of the fiscal year, 1948 was as follows: gross debt, \$63,890,000; full faith and credit long-term debt \$50,349,000; non-guaranteed long-term debt, \$13,541,000; sinking fund offsets to long-term debt, \$3,777,000; net long-term debt, \$60,113,000.

A statement of the city's receipts and expenditures (general revenue fund) at the end of the fiscal year, 1948 showed the following: property taxes, \$12,873,000; other taxes, \$1,317,000; aid from other governments,

\$91,000; other revenue, \$3,859,000; total revenue, \$17,140,000; total general revenue and borrowings, \$24,000,000; total expenditure, \$27,992,000; balance (deficit), \$3,992,000.

The Water Department's financial statement at the end of the fiscal year, 1948 showed the following: operating revenue, \$2,977,000; operating expense, \$1,998,000; net operating revenue (before depreciation), \$979,000; property account, \$14,997,477.

Comparing debt to resources, population and income the following is given: debt to property ratio (all debt to total property account), 1:6.72; per capita debt (all debt using 1945 population estimate), \$104.54; per capita revenue (all revenue), \$41.74; per capita assessed value of property (all property), \$703.52; debt to property ratio (Water Department), 1:1.07; per capita debt (water bonds), \$24.34; per capita revenue (Water Department revenue), \$5.17; per capita assessed value of property (Water Department), \$26.08.

With regard to water rates, the minimum residential monthly charge is \$1.00 for a monthly gallonage of 5,000, \$2.00 for a monthly gallonage of 10,000, \$3.00 for a monthly gallonage of 15,000, \$4.00 for a monthly gallonage of 20,000 and \$5.00 for a monthly gallonage of 25,000. The minimum commercial and industrial monthly charge is \$.50 for a monthly gallonage of 2,500, \$1.00 for a monthly gallonage of 5,000, \$3.00 for 15,000, \$10.00 for 50,000, \$15.00 for 75,000, \$20.00 for 100,000 and \$40.25 for 250,000. The City of Houston gives no special summer water rates. The water system pumps 22,290,000,000 gallons of water per year at a pumping power rate of 53¢ per kilowatt hour. The yearly power pumping cost is \$226,305. The source of water supply is 35 wells. In 1948, 94,338 customers were metered.

Water bills are due and payable ten days after billing. A discount of 5 per-
cent is given for prompt payment but there is no penalty for failure to pay.

San Antonio, Texas

On November 1, 1925 the City of San Antonio issued the following prior
lien water works obligations, the features of which are described as by
Moody¹ below.

5 1/2s 1925 Serially 5 - 1-65 May and November 1 \$ 5,063,000

Interest.---Interest is payable on May and November 1 at the Chemical
Bank and Trust Company of New York.

Denomination.---Coupon, \$1,000.

Security.---These bonds are payable solely from revenues of the water
system and are secured by a first mortgage on the property. The city pledged
to maintain rates sufficient to meet all expenses, charges, et cetera.

Purpose.---Issued to acquire the water plant of the San Antonio Water
Supply Company and for additions thereto.

Rating.---A.

Economic and Financial Background of the City of San Antonio and its
Water Supply Issue

State.---SEE Chapter II, page 8 for economic description of the State of
Texas.

County.---Bexar County has an area of 1,247 square miles of which 74.1
percent was in farm lands at January 1, 1945. Its principal products

¹
Ibid., p. 1198.

(by value) are dairy products, corn, cattle and sorghums. The county had a population of 338,176 in 1940 which had increased to an estimated 470,000 in 1947.

City.—San Antonio is the county seat of Bexar County. It was incorporated as a city in June, 1837. It is the chief commercial center in Western Texas; also an important railway and distributing point and ranks about fourth in the state in manufactures. Its principal industries include meat packing, food processing and manufacturing of iron and steel products, cotton, clothing and cement. In area it is approximately 60 square miles. The city owns and operates its sewage disposal plant, water works, public market and airport.

In 1940 the Federal Bureau of Census showed a population of 253,854 for the City of San Antonio. The population trend since 1900 has been as follows: 1900, 53,321; 1910, 96,614; 1920, 161,379; 1930, 231,542; 1940, 253,854; 1945 estimate, 400,000; 1950 estimate, 500,000.

A statement of the city's manufactures at the end of the fiscal year, 1948 showed the following: number of establishments, 328; wages, \$4,971,000; cost of materials, et cetera, \$25,770,000; value of products, \$43,781,000.

The assessed value of the city's property at the end of the fiscal year, 1948 was as follows: real property, \$183,604,650; all property, \$241,169,750; basis of assessment, 75 percent; city tax per \$1,000, \$19.30; total tax per \$1,000, \$47.10; tax rate limitation, \$22.50 per \$1,000.

The city's bonded debt outstanding at the end of the fiscal year, 1948 was as follows: gross debt, \$54,738,000; full faith and credit long-term debt, \$21,262,000; non-guaranteed long-term debt, \$33,476,000; sinking fund offsets to long-term debt, \$5,113,000; net long-term debt, \$49,625,000.

A statement of the city's receipts and expenditures (general revenue fund) at the end of the fiscal year, 1948 showed the following: property taxes, \$6,296,000; other taxes, \$666,000; aid received from other governments \$6,000; other revenue, \$1,216,000; total revenue, \$8,184,000; total general revenue and borrowings, \$14,216,000; total expenditure, \$10,876,000; balance, \$3,340,000.

The Water Department's financial statement at the end of the fiscal year, 1948 showed the following: operating revenue, \$1,690,000; operating expense, \$848,000; net operating revenue (before depreciation), \$842,000; property account, \$6,361,450.

Comparing debt to resources, population and income the following is given: debt to property ratio (all debt to total property account), 1:4.85; per capita debt (all debt using 1945 population estimate), \$124.06; per capita revenue (all revenue), \$35.54; per capita assessed value of property (all property), \$602.92; debt to property ratio (Water Department), 1:1.25; per capita debt (water bonds), \$12.66; per capita revenue (Water Department revenue), \$4.22; per capita assessed value of property (Water Department), \$15.90.

San Antonio purchased the water system at an agreed valuation in 1925 of seven million dollars cash and the money was secured by issuing revenue bonds. At that time such bonds were comparatively new and interest rates on all bonds were high so this issue called for 5 1/2 percent interest. The issue was designed so that interest and principal payment each year would amount to about \$430,000.

A Deed of Trust contract between the City of San Antonio, the St. Louis Union Trust Company and the Water Works Board of Trustees named in this

Deed of Trust controls the operation of the water system until the last bond is paid off in 1965, after which the Board of Trustees ceases to function and the City governing body takes over. The system is operated by the Trustees just as it was under private ownership.

Rates are established such that over and above operation cost, there is sufficient income to provide for normal expansion and also maintain liquid reserve accounts as insurance protection and to have available money in case of any kind of catastrophe or unforeseen demand.

As the City has grown since 1925 from a population of about 200,000 to a present estimated population of 500,000 so also has the water system grown from an available daily capacity of 23 million gallons to an available capacity of about 90 million gallons. San Antonio does not separate water consumption by industrials from that of other usages. The total consumption in 1948 was 18,381,000,000 gallons.

A reserve is also carried for debt service over and above regular annual demand.

CHAPTER III

THE FEATURES OF MUNICIPAL WATER REVENUE OBLIGATIONS FOR GROUP II, 1948

Beaumont, Texas

On September 1, 1947 the City of Beaumont issued the following water-works improvement and extension revenue obligations, the features of which are described as by Moody¹ below.

2s	1947	Serially to 9 -	1-57	March and September 1	\$ 1,265,000
2 1/4s	1947	Serially to 9 -	1-62	March and September 1	735,000

Maturity.--Due each September 1 in amounts ranging from \$115,000 in 1948 to \$153,000 in 1962.

Interest.--March and September 1 at National City Bank, New York.

Denomination.--Coupon, \$1,000.

Callable.--On any interest date beginning September 1, 1957.

Security.--Payable solely from and secured by a first lien on pledge of net revenues of the water system after operating and maintenance expenses.

Legal Opinion.--Vandewater, Sykes and Herbler, New York.

Purpose.--Proceeds for improvements and additions to the water system.

Offered.--(\$2,000,000) purchased at 100.059; were reoffered in September, 1947 by First Southwest Company, Dallas and associates from a yield of .095 percent to a dollar price of 99 1/2.

Rating.--Baa.

¹

Ibid., p. 1143.

Economic and Financial Background of the City of Beaumont and its
Water Supply Issue

State.--SEE Chapter II, page 8 for economic description of the State of Texas.

County.--Jefferson County was organized in 1837. It has an area of 948 square miles of which 55 percent represented farm lands at January 1, 1945. The principal products (by value) are wheat, rice and dairy products. Its chief industries are oil (refining, equipment and machinery manufacturing and production) and chemicals, including synthetic rubber plants and plastics. Timber is abundant. The county had a population of 145,329 in 1940 which had increased to an estimated 215,000 in 1947.

City.--Beaumont is the county seat of Jefferson County. It is located in the northeast corner of the county on the Neches River, which has a thirty-four foot deep water channel to canals leading to the Gulf of Mexico. It is also located on an Intracoastal Canal, which is now open eastward to the Mississippi River and westward to Galveston.

On June 4, 1946, the electorate approved the annexation of additional territory which increased the area of the city from eleven to thirty-one square miles.

The principal industries of the city are oil producing and refining, rice growing and milling and shipping and lumber industries. It is a distributing center for surrounding territory having an estimated population of 600,000.

The city owns and operates its water works, being entirely self-supporting.

In 1940 the Federal Bureau of Census showed a population of 77,335 for the City of Beaumont. The population trend since 1900 has been as follows: 1900, 9,423; 1910, 20,640; 1920, 40,422; 1930, 57,732; 1940, 77,335; 1945 estimate, 100,000; 1950 estimate, 125,000.

A statement of the city's manufactures at the end of the fiscal year, 1948 showed the following: number of establishments, 80; wages, \$1,584,000; cost of materials, et cetera, \$6,910,000; value of products, \$12,399,000.

The assessed value of the city's property at the end of the fiscal year, 1948 was as follows: real property, \$69,631,370; all property, \$85,031,160; basis of assessment, 85 percent; tax rate limitation, \$25.00 per \$1,000.

The city's general and enterprise debt outstanding at the end of the fiscal year, 1948 was as follows: gross debt, \$8,401,000; full faith and credit long-term debt, \$8,373,000; non-guaranteed long-term debt, \$28,000; sinking fund offsets to long-term debt, \$409,000; net long-term debt, \$7,992,000.

A statement of the city's receipts and expenditures (general revenue fund) at the end of the fiscal year, 1948 showed the following: property taxes, \$1,437,000; other taxes, \$166,000; aid received from other governments, \$26,000; other revenue, \$441,000; total revenue, \$2,070,000; total general revenue and borrowings, \$4,845,000; total expenditure, \$2,827,000; balance, \$2,018,000.

The Water Department's financial statement at the end of the fiscal year, 1948 showed the following: operating revenue, \$412,000; operating expenses, \$240,000; net operating revenue (before depreciation), \$172,000; net operating revenue (after depreciation), \$94,000; property account, \$1,404,015.

Comparing debt to resources, population and income the following is given: debt to property ratio (all debt to total property account), 1:10.64; per capita debt (all debt using 1945 population estimate), \$79.92; per capita revenue (all revenue), \$48.45; per capita assessed value of property (all property), \$85.03; debt to property ratio (Water Department), 1.42:1; per capita debt (water bonds), \$20.00; per capita revenue (water revenue), \$4.12; per capita assessed value of property (Water Department), \$14.04.

With regard to residential water rates there is a minimum monthly charge of \$1.25 for a monthly gallonage of 4,000, \$1.55 for a monthly gallonage of 5,000, \$3.05 for 10,000, \$4.55 for 15,000, \$6.05 for 20,000 and \$7.55 for 25,000. The commercial and industrial monthly minimum charge is \$1.25 for a monthly gallonage of 4,000, \$1.55 for a monthly gallonage of 5,000, \$4.55 for 15,000, \$15.05 for 50,000, \$22.55 for 75,000, \$30.05 for 100,000 and \$66.05 for 250,000. The water system gives no special summer water rate. There are 3,026,000,000 gallons of water pumped each year at a yearly power pumping cost of \$29,260. The source of water supply is a river. In 1948 there were 18,681 customers metered. The water system gives no discount for prompt payment nor is there a penalty for failure to pay.

Amarillo, Texas

On August 15, 1947 the City of Amarillo issued the following water revenue obligations, the features of which are described as by Moody¹ below.

1 1/2s 1947 Serially 8 - 15-48-53 February and August 15 \$ 559,000

¹
Ibid., p. 1139.

2s	1947	Serially 8 -	15-54-58	February and August 15	\$ 662,000
2 1/4s	1947	Serially 8 -	15-59-62	February and August 15	629,000

Maturity.--Due in varying amounts each August 15 as follows: 1 1/2s, 1948-53; 2s, 1954-58; 2 1/4s 1959-62, inclusive.

Interest.--February and August 15 at Chemical Bank and Trust Company, New York.

Denomination.--Coupon, \$1,000.

Callable.--\$516,000 bonds due 1948-52 not callable. \$1,484,000 bonds due 1953-62, inclusive, callable in inverse numerical order or any interest date from August 15, 1952 on 30 days notice at 105 to February 15, 1953, inclusive, and thereafter to each August 15, inclusive, as follows: 1954, 104 1/2; 1955, 104; 1956, 103 1/2 and at 102 1/2 on and after February, 1957.

Security.--Bonds are payable solely from and secured by a first lien on and pledge of net revenues of city's water system, after operating and maintenance expenses.

Purpose.--Proceeds for additions and improvements to the water system.

Legality.--Vandewater, Sykes and Herbler, New York and McCall, Parkhurst and Crowe, Dallas.

Offered.--(\$1,850,000) purchased at 100.004; were reoffered July 24, 1947 by John Nuveen and Company, Chicago and associates on a 0.90 percent to 2.20 percent yield basis.

Rating.--Baa.

Economic and Financial Background of the City of Amarillo and its
Water Supply Issue

State.--SEE Chapter II, page 8 for economic description of the State of Texas.

County.--Potter County has an area of 934 square miles of which 132.4 percent was in farm lands at January 1, 1945. The principal products (by value) are wheat and cattle. Farming is the chief industry; also flour milling, cream manufacturing, packing and zinc smelting. The county had a population of 54,265 in 1940 which had increased to an estimated 65,000 in 1947.

City.--Amarillo is the county seat of Potter County. It was incorporated as a city in 1892. Industries include flour mills, grain elevators, meat packing, railroad shops, oil refineries, zinc smelter, foundries, cottonseed oil mills, fabrication plants, planing mills and helium gas plants. The city owns and operates its sewage and waterworks systems.

In 1940 the Federal Bureau of Census showed a population of 51,686 for the City of Amarillo. The population trend since 1900 has been as follows: 1900, 1,442; 1910, 9,957; 1920, 15,494; 1930, 43,132; 1940, 51,686; 1945 estimate, 70,000; 1950 estimate, 85,000.

The assessed value of the city's property at the end of the fiscal year, 1948 was as follows: real property, \$49,325,100; all property, \$66,783,050; basis of assessment, 80 percent; tax rate limitation, \$26.20 per \$1,000.

The city's general and enterprise debt outstanding at the end of the fiscal year, 1948 was as follows: gross debt, \$8,451,000; full faith and credit long-term debt, \$4,987,000; non-guaranteed long-term debt, \$3,464,000; sinking fund offsets to long-term debt, \$599,000; net long-term debt, \$7,852,000.

A statement of the city's receipts and expenditures (general revenue fund) at the end of the fiscal year, 1948 showed the following: property taxes, \$1,109,000; other taxes, \$192,000; aid received from other

governments, \$1,000; other revenue, \$380,000; total revenue, \$1,682,000; total expenditure, \$2,018,000; balance (deficit), \$336,000.

The Water Department's financial statement at the end of the fiscal year, 1948 showed the following: operating revenue, \$745,000; operating expense, \$178,000; net operating revenue (before depreciation), \$567,000; property account, \$3,894,391.

Comparing debt to resources, population and income the following is given: debt to property ratio (all debt to total property account), 1:8.51; per capita debt (all debt using 1945 population estimate), \$112.17; per capita revenue (all revenue), \$24.03; per capita assessed value of property (all property), \$954.04; debt to property ratio (Water Department), 1:2.10; per capita debt (water bonds), \$26.43; per capita revenue (water revenue), \$10.60; per capita assessed value of property (Water Department), \$55.63.

CHAPTER IV

THE FEATURES OF MUNICIPAL WATER REVENUE OBLIGATIONS FOR GROUP III, 1948

Abilene, Texas

On November 1, 1938 the City of Abilene issued the following water revenue obligations, the features of which are described as by Moody¹ below.

4s A	1938	Serially to 5 -	1-65	May and November 1	\$ 221,000
4s B	1938	Serially to 5 -	1-65	May and November 1	255,000

Interest.—May and November 1 at the office of the City treasurer.

Denomination.—Coupon, \$1,000.

Security.—These bonds are secured by an indenture on the city's water system, the revenues of which are pledged for the support of the bonds.

Purpose.—Proceeds for additions and improvements to the water system.

Rating.—Revenue bonds are not rated.

Economic and Financial Background of the City of Abilene and its Water Supply Issue

State.—SEE Chapter II, page 8 for economic description of the State of Texas.

County.—Taylor County was incorporated in 1878. It has an area of 908 square miles of which 74.6 percent was in farm lands at January 1, 1945. The chief industry is agriculture. Its principal products (by value) are cotton, sorghums, cattle, dairy products and wheat. The county had a

¹
Ibid., p. 1138.

population of 44,147 in 1940 which had increased to an estimated 50,000 in 1946.

City.--Abilene is the county seat of Taylor County. It was incorporated as a city in 1883. Its principal industries include cotton compresses and warehouses, cotton oil and feed mills, creameries, stockyards and poultry-dressing plants. The city owns and operates its sewage disposal plant and waterworks.

In 1940 the Federal Bureau of Census showed a population of 26,612 for the City of Abilene. The population trend since 1900 has been as follows: 1900, 3,411; 1910, 9,204; 1920, 10,274; 1930, 23,175; 1940, 26,612; 1945 estimate, 35,000; 1950 estimate, 55,000.

The assessed value of the city's property at the end of the fiscal year, 1948 was as follows: real property, \$26,022,560; all property, \$35,302,050; basis of assessment, 60 percent; city tax per \$1,000, \$25.00; tax rate limitation, \$25.00 per \$1,000.

The city's general and enterprise debt outstanding at the end of the fiscal year, 1948 was as follows: gross debt, \$5,715,000; full faith and credit long-term debt, \$5,256,000; non-guaranteed long-term debt, \$459,000; sinking fund offsets to long-term debt, \$371,000; net long-term debt, \$5,344,000.

A statement of the city's receipts and expenditures (general revenue fund) at the end of the fiscal year, 1948 showed the following: property taxes, \$842,000; other taxes, \$105,000; aid received from other governments, \$392,000; other revenue, \$91,000; total revenue, \$1,430,000; total general revenue and borrowings, \$2,230,000; total expenditure, \$1,424,000; balance, \$806,000.

The Water Department's financial statement at the end of the fiscal year, 1948 showed the following: operating revenue, \$531,000; operating expense, \$146,000; net operating revenue (before depreciation), \$385,000; property account, \$671,787.

Comparing debt to resources, population and income the following is given: debt to property ratio (all debt to total property account), 1:6.60; per capita debt (all debt using 1945 population estimate), \$152.68; per capita revenue (all revenue), \$63.71; per capita assessed value of property (all property), \$1,008.63; debt to property ratio (Water Department), 1:1.41; per capita debt (water bonds), \$13.60; per capita revenue (water revenue), \$15.17; per capita assessed value of property (Water Department), \$19.19.

With regard to residential water rates there is a minimum monthly charge of \$1.50 for a monthly gallonage of 5,000, \$2.50 for a monthly gallonage of 10,000, \$3.50 for 15,000, \$4.50 for 20,000 and \$5.50 for 25,000. The commercial and industrial monthly minimum charge is \$1.50 for a monthly gallonage of 5,000, \$3.50 for a monthly gallonage of 15,000, \$10.50 for 50,000, \$15.50 for 75,000, \$20.50 for 100,000 and \$50.50 for 250,000. There are no special summer water rates given. There are 2,370,000,000 gallons of water pumped per year at a yearly power pumping cost of \$36,000. The source of water supply is three lakes. In 1948 there were 11,350 customers metered. Water bills are due and payable on the 10th and 25th of each month. No discount is given for prompt payment. However, service is discontinued as a penalty for failure to pay.

Bryan, Texas

On December 1, 1946 the City of Bryan issued the following joint electric, water and sewer system revenue obligations, the features of which

are described as by Moody¹ below.

1s	1946	Serially 12 -	1-48-51	June and December 1	\$ 235,000
2s	1946	Serially 12 -	1-52-56	June and December 1	440,000
2 1/2s	1946	Serially 12 -	1-57-59	June and December 1	335,000
2 3/4s	1946	Serially 12 -	1-60-71	June and December 1	1,970,000

Maturity.—Due each December 1 in amounts varying from \$35,00 in 1948 to \$200,000 in 1971.

Denomination.—Coupon, \$1,000; registerable as to principal.

Registrar.—City Secretary, Bryan.

Callable.—On any interest date from December 1, 1956 at par and interest.

Bond Retirement and Reserve Fund.—Monthly, 1/12 of 120 percent of annual principal and interest requirements to be reduced to 1/12 of such requirements whenever reserve on hand equals two years such requirements.

Security.—An exclusive first lien on and payable solely from combined net revenues of electric, waterworks and sewer systems (after operating expenses). City covenants to maintain rates and charges sufficient to meet operating expenses, maintenance, repairs, betterments, depreciation, et cetera, debt service and bond retirement and reserve fund requirements.

Creation of Additional Debt.—City will not issue further debt against systems or sell or otherwise encumber physical properties thereof.

Purpose.—Proceeds to improve systems and purchase new equipment.

Legality.—Subject to approval by Chapman and Cutler, Chicago.

¹

Ibid., p. 1148.

Offered.—(\$3,000,000) in November, 1946 by a syndicate headed by First Southwest Company and R. A. Underwood and Company, Incorporated, Dallas on a 1.95 percent to 2.58 percent yield basis for 2 1/2s and 2 3/4s (1s and 2s previously sold).

Interest.—June and December 1 at First National Bank, Dallas.

Rating.—Baa.

Economic and Financial Background of the City of Bryan and its Water Supply Issue

State.—SEE Chapter II, page 8 for economic description of the State of Texas.

County.—Brazos County has an area of 583 square miles of which 85 percent was in farm lands at January 1, 1945. Its principal products (by value) are cotton, cattle, dairy products and poultry. The county had a population of 26,977 in 1940 which had increased to 27,106 in 1943.

City.—Bryan is the county seat of Brazos County. The city was incorporated in 1886. It has an area of 10 1/2 square miles. It is the seat of A & M College of Texas and a commercial and shipping center for the surrounding area. The industries include a textile mill, cottonseed oil mills, cotton compress, wood-working plants and wholesale grocery houses. The city owns and operates its electric light plant, sewage disposal plant and water works.

In 1940 the Federal Bureau of Census showed a population of 11,842 for the City of Bryan. The population trend since 1900 has been as follows: 1900, 3,589; 1910, 4,132; 1920, 5,500; 1930, 7,814; 1940, 11,842; 1945 estimate, 16,500; 1950 estimate 25,000.

The assessed value of the city's property at the end of the fiscal

year, 1948 was as follows: all property, \$9,824,908; basis of assessment, 40 percent; city tax rate per \$1,000, \$26.50; tax rate limitation, \$30.00 per \$1,000.

The city's bonded debt outstanding at the end of the fiscal year, 1948 was as follows: general debt, \$721,000; revenue debt, \$3,000,000; sinking fund offsets, \$51,606; net long-term debt, \$3,669,394.

A statement of the city's receipts and expenditures (general revenue fund) at the end of the fiscal year, 1948 showed the following: property taxes, \$924,000; other taxes, \$91,000; aid received from other governments, \$377,000; other revenue, \$294,000; total revenue, \$1,686,000; total expenditure, \$1,385,000; balance, \$301,000.

The Water Department's financial statement at the end of the fiscal year, 1948 showed the following: gross income, \$129,423; operating expenses, \$74,097; net income, \$55,326.

The Electric Department's financial statement at the end of the fiscal year, 1948 showed the following: gross income, \$342,549; operating expenses, \$172,761; net income, \$169,788.

The Sewer Department's financial statement at the end of the fiscal year, 1948 showed the following: gross income, \$25,067; operating expenses, \$19,609; net income, \$5,458.

The total joint gross income for the Water, Electric and Sewer Departments was \$497,039 from which was deducted a total joint operating expense of \$266,467 giving it a total joint net income of \$230,572. The amount of the joint property account was \$3,762,801.

Comparing debt to resources, population and income the following is given: debt to property ratio (all debt to total property account), 1:2.67; per capita debt (all debt using 1945 population estimate), \$222.38; per

capita revenue (all revenue), \$102.09; per capita assessed value of property (all property), \$595.44; debt to property ratio (Water Department), 1:1.26; per capita debt (water bonds), \$180.60; per capita revenue (water revenue), \$30.12; per capita assessed value of property (Water Department), \$228.04.

CHAPTER V

SUMMARY AND CONCLUSION

From the foregoing analysis it can be concluded that the extent of use of certain methods of municipal finance must be tailored to the special character of the city. What is good for Jack is not necessarily good for John. Two cities, even in the same state, can be as different from each other in their methods of financing municipal borrowing as two quite different individuals in their methods of securing and meeting financial aid. By and large, municipalities continue to rely very heavily upon the property tax to support their municipal securities. However, in the case of municipal enterprise debt recently there have been some outstanding exceptions. Public bodies have chosen to issue revenue bonds rather than general obligations in the case of enterprise debt because of one or more of the following considerations.

1. Inability to issue general obligations because of legal limitations upon the amount of such debt which can be incurred.
2. To avoid any increase in debt legally payable from taxation; use of the revenue instrument protects the tax payer in case of failure of the enterprise to be fully self-liquidating.
3. The feeling that a utility venture should be self-supporting without a tax subsidy.
4. The feeling that a facility should be paid for by users of the facility alone rather than by the community at large.
5. In instances where the general credit of a municipality is not highly regarded, revenue bonds may command a more favorable

market than general credit bonds, that is, they can be sold at lower rates of interest.

This latter consideration is believed to be of utmost importance as a reason for the use of revenue bonds in financing the water enterprises of the cities studied in this Thesis. The rating as given by Moody to the general obligations issued by all six cities is Baa which means that the bonds are considered as lower medium grade obligations, that is, they are neither highly protected nor poorly secured. Such obligations lack outstanding investment characteristics and in fact have speculative characteristics as well. This fact brings out the point that the general credit of the municipalities studied is not highly regarded.

It has been the purpose of this Thesis to analyze specific municipal water enterprise debt weighting any influences upon the terms and status of the issues taking into consideration legality and quality. In making this evaluation of the features of municipal water revenue obligations for selected cities in the State of Texas, 1948 the following points were considered.

1. Inasmuch as the ability of a local government to pay operating expenses and meet debt service depends in considerable measure upon the amount and stability of community income, this analysis has included an evaluation of the resources of the surrounding area of each city. The economic and financial background of the city and surrounding area inevitably exercise a strong influence in determining the probable success of the municipality in charging and collecting the revenues necessary to service the debt. The size and growth of the municipality is especially important.

2. The practice of pledging certain revenues to specific uses may have an adverse effect on the general credit of a unit as some governments may be tempted to make a projected bond issue more salable by pledging any revenues which are available. Insofar as the pledge succeeds in making the new issue more secure, it weakens the position of the general creditors. However, if a municipality issues debt to purchase an earning asset and pledges the revenues therefrom for the servicing of that debt, the general credit is not adversely affected, provided, of course, that the revenues are sufficient.
3. Plans for debt retirement, without resorting to refunding can be developed around term bonds and adequate sinking funds, or serials with well spaced maturities. It seems that investment opinion favors serial issues especially in the case of enterprise debt as the use of serial bonds may add rigidity to the budget increasing the necessity for a carefully prepared plan of debt retirement.
4. A long-term credit, no matter what its type, can be considered a sound investment only if the debtor's probable future income is sufficient to handle debt service satisfactorily. Adequacy of revenue to service enterprise debt is a most important point.
5. A complete statement of all debt outstanding is essential in making an analysis of any one form of municipal indebtedness. From such a statement it is possible to evaluate the soundness of the debt structure as a whole and the relative position of any one issue.
6. A determination of whether the debt of a unit is within safe limits can be made by comparisons of debt to resources, population and

income. Comparisons of this type may not come as near to summing up the situation in the field of municipal credit as "times fixed charges earned" does in the field of corporate credit. However, the debt to property ratio and per capita figures, per capita debt, per capita assessed value of property, per capita revenue, may be very revealing. From the relationship between these ratios, it is possible to make some rather definite inferences as to the safety of the debt. (A more complete analysis would be made over a period of years).

Applying the above points to the water revenue issues of the selected cities the following conditions were revealed to exist.

1. The wealth per capita of the State of Texas is relatively high. Its principal industries suggest ample employment for its citizens. The State has had no outstanding record of default on its obligations.
2. Every city played a conspicuous part in the total economic resources of the county in which each was situated.
3. Gross and net long-term debt decreased with the size of the cities.
4. The amount of full faith and credit general long-term debt for each city exceeded the amount of non-guaranteed general debt. Three cities, Beaumont, Abilene and Bryan, had no non-guaranteed general debt.
5. In one-half of the cities, the amount of non-guaranteed enterprise debt exceeded the amount of full faith and credit enterprise debt. The total amount of enterprise debt for Bryan was non-guaranteed.
6. In each of the cities the total value of all property exceeded the amount of all debt outstanding.

7. Per capita debt exceeded per capita revenue in every case. However, per capita assessed value of property was high and exceeded the amount of per capita debt for each city.
8. The amount of total revenue and total costs decreased with the size of the cities. The ratios of revenue to cost indicate that the interest payments may not be relied on over any great length of time. Two cities, Houston and Amarillo had total costs in excess of total revenues.
9. There is a relationship between the size of the city and the size of the water revenue issue. This brought out by the fact that the size of the issues decreased as cities grew smaller, demand decreasing with size. Bryan issued joint revenue obligations which accounts for the large size of its issue.
10. The timing of the issue influenced the coupon rate. Interest rates on water revenue obligations have decreased since 1925.
11. All water revenue obligations were classed as long-term debt. All issues were serial issues with long maturities.
12. In only one case did water debt exceed the water property account. Beaumont had a 1.42:1 ratio.
13. Per capita water debt exceeded per capita water revenue in every case. However, per capita assessed value of water property was high and exceeded per capita water debt.
14. In every case operating water revenue exceeded the amount of operating water costs, the ratios ranging from 4.1:1 to 1.4:1. The ratios indicate that the water debt can be adequately serviced.
15. The features of all the issues were relatively consistent.

- a. The bonds were issued at low coupon rates with the exception of San Antonio whose water bond rate was 5 1/2 due to the timing of the issue since this issue was brought out in 1925 at a time when interest rates on all bonds were high.
- b. All issues with the exception of the San Antonio issue were relatively new, the dates ranging from 1938 to 1947 with 1947 appearing most frequently.
- c. The dates of maturity on all issues were so arranged that certain bonds would be due in varying amounts each year.
- d. All bonds were serial bonds with is especially favorable to the investor who can thus purchase his issues with maturities to suit his need. Enterprise income is predictable which logically accounts for the serial plan of retirement. This plan can also be attributed to the fact that enterprises experience steady depreciation which requires steady retirement of debt.
- e. All six issues were coupon bonds issued in denominations of \$1,000.
- f. All issues were callable in varying amounts declining with the approach to maturity. (This information was not available for San Antonio and Abilene).
- g. In every case the issues were secured by a pledge of the net revenues of each respective water system.
- h. All issues were subject to approval by legal consultants on municipal finance.
- i. Five of the six issues studied were for the purpose of improvements and additions to the water plant. San Antonio's issue

was for the purpose of purchasing the water plant and additions thereto.

- j. Two issues were not rated by Moody. Three issues were given Baa ratings which indicates that these obligations lack outstanding investment characteristics and in fact have speculative characteristics as well. One issue was given a rating of A which indicates that factors giving security to principal and interest are considered adequate but elements may be present which suggest a susceptibility to impairment sometime in the future. A rating of Aa was formerly given the latter issue mentioned.
- k. Various other major provisions found were: reserve accounts were maintained as insurance protection and the city pledged to maintain sufficient rates for the San Antonio issue; the city pledged not to encumber the systems with additional debt for the Houston and Bryan issues.
- l. Bryan issued joint electric, waterworks and sewer system revenue bonds serviced from the joint revenues of these systems. It is sometimes necessary for a small city like Bryan to issue joint revenue obligations due to the city's inability to finance its enterprises separately.

The record indicates that the best utility bonds are safe investments, but obviously there are enough exceptions to make it necessary to check each issue individually. A more technical analysis is required to determine credit quality where specific revenues are pledged than where only the general credit is involved. Whenever investors depend on pledged revenues rather than on the power to tax, a careful check should be made to ascertain:

(1) that the revenues will be sufficient to pay total debt service over the life of the bond issue; (2) that provision has been made to meet debt service in periods of low receipts; and (3) that adequate safeguards have been provided against the elimination or diversion of the pledged revenue before the debt is paid. In addition to the usual factors to be investigated in a municipal credit analysis, the soundness of the project as a business enterprise should be studied.

Conclusively, then, the purchaser of municipal water revenue bonds would have a vital interest in the soundness of the revenue system as a whole. The first step in his analysis would be an evaluation of the reason for the issue. The next step would be a comparison of total and enterprise debt to resources, population and income. A thorough investigation would then be made of the Water Department with emphasis on management and engineering. After investigation of the economic and financial feasibility of the issue an analysis would be made of the pertinent features in the agreement. (The official statement relating to the issuance of the bonds prepared by the legal consultants furnishes the investor with a great deal of information).

In the final analysis, the entire investigation seeks to answer two questions - (1) Is the issue expedient? (2) Can the debt be adequately serviced? A survey of the resources of the city and an appraisal of the sources and probable stability of the income of the enterprise must be investigated in detail as prudence requires that commitments to purchase be made only on the basis of a complete analysis.

TABLE 1

GENERAL AND ENTERPRISE DEBT OUTSTANDING FOR SELECTED CITIES IN TEXAS
AT END OF FISCAL YEAR, 1948

(In thousands)

City and purpose of debt	Gross debt	Total	Long-term debt		Short term debt	Sinking-fund off-sets(long-term debt)		Net long-term debt	
			Full faith and credit	Non-guaranteed		Total	Full faith and credit only	Total	Full faith and credit only
GROUP I. - CITIES OF MORE THAN 100,000 POPULATION									
Houston	\$63,890	\$63,890	\$50,349	\$13,541	---	\$3,777	\$2,862	\$60,113	\$47,487
General	47,807	47,807	47,417	390	---	3,036	2,646	44,771	44,771
Enterprise	16,083	16,083	2,932	13,151	---	741	216	15,342	2,716
San Antonio	54,738	54,738	21,262	33,476	---	5,113	1,657	49,625	19,605
General	19,617	19,617	19,438	179	---	1,566	1,544	18,051	17,894
Enterprise	35,121	35,121	1,824	33,297	---	3,547	113	31,574	1,711
GROUP II. - CITIES OF 50,000 TO 100,000 POPULATION									
Beaumont	8,401	8,401	8,373	28	---	409	401	7,992	7,972
General	6,601	6,601	6,601	---	---	257	257	6,344	6,344
Enterprise	1,800	1,800	1,772	28	---	152	144	1,648	1,628
Amarillo	8,451	8,451	4,987	3,464	---	599	464	7,852	4,523
General	4,432	4,432	2,932	1,500	---	487	352	3,945	2,580
Enterprise	4,019	4,019	2,055	1,964	---	112	112	3,907	1,943
GROUP III. - CITIES OF LESS THAN 50,000 POPULATION									
Abilene	5,715	5,715	5,256	459	---	371	335	5,344	4,921
General	2,868	2,868	2,868	---	---	182	182	2,686	2,686
Enterprise	2,847	2,847	2,388	459	---	189	153	2,658	2,235
Bryan	3,721	3,721	721	3,000	---	51	(a)	3,669	(a)
General	721	721	721	---	---	(a)	(a)	(a)	(a)
Enterprise	3,000	3,000	---	3,000	---	(a)	(a)	(a)	(a)

(a) Data not available

Source: Compiled from Compendium of City Government Finances in 1948, United States Bureau of the Census. pp. 61-74.

TABLE 2

COMPARATIVE SUMMARY STATEMENT OF SPECIFIC NORMS RELATIVE TO
MUNICIPAL INDEBTEDNESS FOR SELECTED CITIES IN TEXAS, 1948

City	When in- cor- po- rat- ed	Type of City ¹	Relation between debt and property			Per capita assessed value of pro- perty	Relation between revenue and costs			Per capita revenue
			Debt Value of property	to pro- perty ratio	Per capita debt		Total revenue	Total costs	Ratio of revenue to costs	
GROUP I. - CITIES OF MORE THAN 100,000 POPULATION										
Houston	1839	(A)	\$60,113,000	\$404,528,700	1:6.72	\$104.54	\$703.52	\$24,000,000	\$27,992,000	.85:1 \$ 41.74
San Antonio	1837	(A)	49,625,000	241,169,750	1:4.85	124.04	602.92	14,216,000	10,876,000	1.3:1 35.54
GROUP II. - CITIES OF 50,000 TO 100,000 POPULATION										
Beaumont	(a)	(E)	7,992,000	85,031,160	1:10.6	79.92	850.31	4,845,000	2,827,000	1.7:1 48.45
Amarillo	1892	(B)	7,852,000	66,783,050	1:8.51	112.17	954.04	1,682,000	2,018,000	.83:1 24.03
GROUP III. - CITIES OF LESS THAN 50,000 POPULATION										
Abilene	1883	(C)	5,344,000	35,302,050	1:6.60	152.68	1,008.63	2,230,000	1,424,000	1.5:1 63.71
Bryan	1886	(D)	3,669,394	9,824,908	1:2.67	222.38	595.44	1,686,000	1,385,000	1.2:1 102.09

¹(A) Railroad and commercial center

(B) Industrial

(C) Agricultural trading center

(D) Educational center

(a) Data not available

TABLE 3

COMPARATIVE SUMMARY STATEMENT OF SPECIFIC NORMS RELATIVE TO
MUNICIPAL WATER REVENUE OBLIGATIONS FOR SELECTED CITIES IN TEXAS, 1948

(Columns 2, 10 and 11 in thousands)

City	Size of issue	Rate	Date of issue	Date of maturi- ty	Relation between debt and property		Per capita debt	Per capita value of pro- perty	Relation between op- erating revenue and operating costs			Per capita revenue	
					Property account	Debt to pro- perty ratio			Reve- nue	Costs	Ratio		
GROUP I. - CITIES OF MORE THAN 100,000 POPULATION													
Houston	\$ 2,344 11,656	4 1/4 2	10/1/44 10/1/44	1-47-51 1-52-69	\$14,997,477	1:1.07	\$ 24.34	\$ 26.08	\$2,997	\$1,998	1.5:1	\$ 5.17	
San Antonio	5,063	5 1/2	11/1/25	1-65	6,361,450	1:1.25	12.66	15.90	1,690	848	2:1	4.22	
GROUP II. - CITIES OF 50,000 TO 100,000 POPULATION													
Beaumont	1,265 735	2 2 1/4	9/1/47 9/1/47	1-57 1-57-62	1,404,015	1.42:1	20.00	14.04	412	240	1.7:1	4.12	
Amarillo	559 662 629	1 1/2 2 2 1/4	8/15/47 8/15/47 8/15/47	15-48-53 15-54-58 15-59-62	3,894,391	1:2.10	26.43	55.63	745	178	4.1:1	10.60	
GROUP III. - CITIES OF LESS THAN 50,000 POPULATION													
Abilene	221 255	4 A 4 B	11/1/38 11/1/38	1-65 1-65	671,787	1:1.41	13.60	19.19	531	146	3.6:1	15.17	
Bryan	235 440 335 1,970	1 2 2 1/2 2 3/4	12/1/46 12/1/46 12/1/46 12/1/46	1-48-51 1-52-56 1-57-59 1-60-71	3,762,801	1:1.26	180.60	228.04	497	266	1.4:1	30.12	

TABLE 4

COMPARATIVE SUMMARY STATEMENT OF PERTINENT FEATURES OF
MUNICIPAL WATER REVENUE OBLIGATIONS FOR SELECTED CITIES IN TEXAS, 1948

(Column 2 in thousands of dollars)

City	Size of issue	Rate	Date of issue	Date of maturity	Plan of retire- ment	Denomi- nation	Call Price(if callable)	Security	Legality	Purpose	Rating given by Moody	Other major provisions
GROUP I. - CITIES OF MORE THAN 100,000 POPULATION												
Houston	2,344 1/4	11,656 2	10/1/44	1-47-51	Serially	Coupon	102 1/2 to 10/1/53 101 1/2 to 10/1/57 101 to 10/1/60 thereafter at par	Pledge of net revenues of water system	Approved by Reed, Hoyt and Washburn, New York	Plant addi- tions and expan- sion	No rating	No addi- tional bonds may be issued with a lien prior to this issue
San Antonio	5,063 5 1/2		11/1/25	1-65	Serially	Coupon	(a) \$1,000	First mortgage on water system property	Deed of Trust contract exists between City and St. Louis Union Trust Company	To purchase water plant and addi- tions there- to	A	City pledges to maintain sufficient rates Insurance reserve account maintained
GROUP II. - CITIES OF 50,000 to 100,000 POPULATION												
Beaumont	1,265 2	735 2 1/4	9/1/47	1-57	Serially	Coupon	On any interest date beginning 9/1/57	First lien on pledge of net revenues	Vande- water, Sykes and Herbler, New York	Improve- ments and addi- tions to water system	Baa	

TABLE 4 (continued)

COMPARATIVE SUMMARY STATEMENT OF PERTINENT FEATURES OF
MUNICIPAL WATER REVENUE OBLIGATIONS FOR SELECTED CITIES IN TEXAS, 1948

(Column 2 in thousands of dollars)

City	Size of issue	Rate of issue	Date of maturity	Plan of retire- ment	Denomi- nation	Call price (if callable)	Security	Legality	Purpose	Rating given by Moody	Other major provisions
GROUP II. - CITIES OF 50,000 TO 100,000 POPULATION (continued)											
Amarillo	\$ 559	1 1/2	8/15/47	15-48-53	Serially Coupon	\$516,000	First	Vande-	Addi-	Baa	
	662	2	8/15/47	15-54-58		\$1,000	bonds due	lien	water,	tions	
	629	2 1/4	8/15/47	15-59-62			48-52 not	on and	Sykes	and	
							callable	pledge	and	improve-	
							Balance-	of net	Herbler,	ments	
							from	revenues	New York	to	
							8/15/52		and	water	
							105 to		McCall,	system	
							2/15/53		Parkhurst		
							104 1/2 to		and		
							8/15/54		Crowe,		
							varying		Dallas		
							amounts to				
							102 1/2				
GROUP III. - CITIES OF LESS THAN 50,000 POPULATION											
Abilene	221	4 A	11/1/38	1-65	Serially Coupon	(a)	Pledge	(a)	Addi-	No	
	255	4 A	11/1/38	1-65		\$1,000	of net		tions	rating	
							revenues		to		
									system		
Bryan	235	1	12/1/46	1-48-51	Serially Coupon	On any	Lien on	Chapman	To	Baa	City will
	440	2	12/1/46	1-52-56		\$1,000	date from	combined	improve		issue
	335	2 1/2	12/1/46	1-57-59			12/1/56	net	Cutler,	systems;	further
	1,970	2 3/4	12/1/46	1-60-71			at par and	revenues	Chicago	purchase	against
							interest		equipment		systems

(a) Data not available

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